

## THE REPUTED FOSSIL MAN OF THE NEANDERTHAL.

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As it is my intention to confine myself to the consideration of the Neanderthal fossil with reference to its place in Nature, I must necessarily be brief in my remarks on the circumstances under which it occurred, and on its geological age.

The fossil was found in 1857, embedded in mud in a cave or fissure intersecting the southern rocky side of the ravine or deep narrow valley, called the Neanderthal, situated near Hochdal between Düsseldorf and Elberfeld. A small stream or rivulet, known as the Düssel, flows along a narrow channel about sixty feet below the lowest part of the fissure, and on one side of the valley.

It has long been known that human bones, belonging to an extinct race, and occurring in stalagmite along with the remains of the mammoth and other fossil animals, have been found in the limestone fissures or caverns of the lofty precipices which overhang the river Meuse, in Belgium, about seventy English miles south-west of the Neanderthal.

Lycell's late work, 'The Antiquity of Man,' contains a very lucid description of the Meuse caverns, and of the one under consideration. In both cases it is evident that we have examples of ancient swallow-holes, into which have been washed bones, mud, and gravel, when their openings existed in the bed of large and powerful rivers. It was doubtless by the incessant abrading action of such ancient streams, continued for countless ages, that the Neanderthal, and much of the broad valley of the Meuse, became scooped out.

Few Geologists will dispute that the Meuse caverns are of the same age as the flint-implement gravels of the Somme, and that both belong to the latest division of the glacial or (as I have lately termed it) Clydian period.\* If we accept the physical conditions of the Meuse caverns as demonstrative of their having been filled up in that remote age, we cannot but recognize in the corresponding conditions of the Neanderthal fissure evidences which claim for it an equally high antiquity, notwithstanding certain differences seemingly supporting the opposite conclusion.

The want of stalagmite and the *doubtful* absence of remains of extinct animals in the Neanderthal fissure may be readily explained; and as to the physical differences, the Düssel is certainly not to be compared with the Meuse for size and abrading power, but it must be admitted that a mere rivulet may take quite as much time to scoop out a "ravine" as a river to excavate a considerable portion of a broad valley.

Having finished my preliminary remarks, I shall next proceed to notice the fossil itself.

According to Dr. Fuhlrott, of Elberfeld, the skeleton was found

\* See 'Synoptical Table of the Aqueous Rock-Systems,' 5th edition.

by some workmen while quarrying the rock where the cave occurs; but, knowing nothing of the importance of the discovery, and being very careless about it, they secured chiefly only the larger bones. Fortunately these fell into the hands of Fuhlrott, and they were shortly afterwards described by Professor Schaaffhausen, of Bonn. The principal parts of the skeleton which have been preserved are the cranium; both thigh bones, perfect; a perfect right humerus; a perfect radius; the upper third of a right ulna corresponding to the humerus and radius; a left humerus, of which the upper third is wanting; a left ulna; a left ilium, almost perfect; a fragment of the right scapula; the anterior extremities of a rib of the right side; the same part of a rib of the left side; the hinder part of a rib of the right side; and two short hinder portions, and one middle portion of some other ribs.

The skeleton, or rather, as much as is preserved of it, is characterized by unusual thickness, and a great development of all the elevations and depressions for the attachment of the muscles. The ribs, which have a singularly rounded shape, and an abrupt curvature, more closely resemble the corresponding bones of a carnivorous animal, than those of man.\*

Although a difficulty may be felt in resting a satisfactory argument upon merely the great size of its osseous framework, and the peculiar form of its ribs, it cannot but be admitted that these characters afforded some grounds for the belief, at first entertained, that the Neanderthal fossil had not belonged to a human being. Whether a more close examination of other parts of the fossil will confirm this hypothesis, it is the object of the present paper to determine.

The skull is deficient in its basal and facial portions, but retains all the parts lying above a line connecting the *glabella*—or space between the eye-brows—and the *centre* of the posterior part of the skull immediately above the hollow of the neck, to which the name occipital or posterior tubercle is given.† Fortunately the parts alluded to, which are of uncommon thickness, enable one to determine some highly important points in craniology.

The *frontal*—or bone of the forehead‡—possesses the upper border and roof-plate of the eye-sockets, the inter-orbital space, the orifices of the frontal sinuses, and both outer orbital processes: the upper part of the alisphenoid belonging to the right side appears also to be present. The *occipital*—or posterior bone—retains, in addition to the tubercle, the superior transverse ridges. The *parietals*—or upper side-bones—possess the impression of the temporal squamosal. The *temporals*—or lower side-bones—are broken off, though it would appear from Huxley's figure,§ that the mammillary portion of the left one is still preserved. The *lambdoidal suture*—or joining of the parietals

\* See Busk's translation of Schaaffhausen's paper in the 'Natural History Review,' 1861, pp. 158-162.

† The line A A, in Fig. 1, Plate I., passes from the *glabella* to the occipital tubercle.

‡ The explanation of the individual parts of the skull is prefixed to Plates I. and II.

§ See 'Man's Place in Nature,' Fig. 25 A, facing page 138.

and the occipital—including the *additamentum*, is well-marked; the *sagittal suture*—or joining of the parietals in the medio-longitudinal line of the skull—is obscure; while the *coronal suture*—or joining of the frontal and parietals in front of, and at right angles to the last-named *suture*—is but faintly marked at the crown and obliterated at the sides. The bounding line of the temporal muscles (situated on each side of the skull in front of, and above the ear) is tolerably well defined.

In general terms, the Neanderthal skull is of an elongated oval form, with a basal outline bearing much resemblance to that of the Negro cranium represented by Martin.\* It is of large size, being about an inch longer than ordinary British skulls; in width, however, it does not much exceed them. The forehead, uncommonly low and retreating, terminates in front by enormously projecting brow or superciliary ridges, which, besides being very thick, slightly rounded on their anterior aspect, and rather strongly arched above the eye-sockets, extend uninterruptedly across from one side to the other. The outer orbital processes—or horns of the brow-ridges—are also unduly developed; being thick and projecting. On the whole, there is a remarkable absence of those contours and proportions which prevail in the forehead of our species; and few can refuse to admit that the deficiency more closely approximates the Neanderthal fossil to the anthropoid apes than to *Homo sapiens*.

The greatest width of the skull is towards its posterior part, and on a level not much higher than the mammillary region—a character which is essentially pithecoïd or simial. In human skulls, the greatest width is considerably higher—usually on a line connecting the centres of ossification of the parietals:† on the contrary, the Neanderthal cranium, like that of the Chimpanzee, is without any particular prominence where those centres may be assumed to be situated.

In addition to possessing a low retreating forehead, the fossil skull is remarkably flattened at the vertex, which, according to Huxley, rises about 3·4 inches only above what is called the glabello-occipital plane:‡ in Man, the corresponding part is generally about an inch higher. From the vertex there is a slightly curving fall both towards the front and the back, ending in the former direction at the origin of the brow-ridges, and in the latter, at the occipital tubercle. The curving is more rounded and regular on the anterior half—particularly at the upper portion of the brow, which, in consequence, is somewhat prominent—than on the posterior half: on the latter, there is a slight depression just above the apex of the lambdoidal suture. The posterior fall of the Neanderthal skull, as a peculiarity, was first pointed out by Huxley, who remarks that “the occipital region slopes obliquely upward and forward, so that the lambdoidal suture is situated well upon the upper surface of the cranium:” in other words, when the glabello-occipital plane is made horizontal, the apex of the lambdoidal suture is decidedly in front of the posterior tubercle. In ordinary

\* ‘Natural History of Man and Monkeys,’ fig. 182, p. 120.

† Plate II. fig. 5, *b*.

‡ See Plate I. fig. 1, A A.

skulls, it is well known, the backward slope terminates near the apex of the lambdoidal suture, below which the occipital bone stands more or less vertical to the glabello-occipital plane. The Neanderthal cranium, in its posterior features, is approached by some savage races; also occasionally by a few inhabitants of the British Isles. Moreover, judging from the few data at our command, the approximation apparently characterized the ancient "Borreby people," and the extinct race of the Meuse, supposing the latter to be represented by a nearly perfect skull which Schmerling obtained from the Engis cave near Liège;\* but in no human tribe extinct, or existing, do we find both the vertex and the occiput so depressed and ape-like. Well might Huxley have felt a "difficulty in believing that a human brain could have its posterior lobes so flattened and diminished as must have been the case in the Neanderthal man."

Much of the hinder half of the skull partakes of the slight roundness just noticed; but anterior to its greatest width, in the areas which were embraced by the temporal muscles, the sides are perpendicular, and their "fore and aft" outline is straight and remarkably long.

In these general characters, the Neanderthal skull is at once observed to be singularly different from all others which admittedly belong to the human species; and they undoubtedly invest it with a close resemblance to that of the young Chimpanzee, represented by Busk in his translation of Shaaffhausen's memoir.†

Another differential feature characterizes the fossil in question. In human skulls, even those belonging to the most degraded races, if the forehead be intersected at right angles to the glabello-occipital plane, on a line connecting the two outer orbital processes at their infero-anterior point, the intersection will cut off the frontal bone in its entire width, and to a considerable extent rising towards the coronal suture;‡ whereas in the Neanderthal skull, the same intersection will cut off only the inferior and little more than the median portion of the frontal.§ This is quite a simial characteristic, and rarely, if ever, occurs in man.||

\* This is the only speciality in which the Engis and Neanderthal skulls agree.

† See 'Natural History Review,' 1861, Plate IV. fig. 6.

‡ See Plate II. fig. 5, B.B.

§ See Plate I. fig. 1, B.B.

|| I have examined and made myself acquainted with skulls belonging to the principal races or varieties of man, in all of which the forward position of the forehead, relatively to the outer orbital processes, is the general rule. The Engis skull exhibits it, and the same appears to be the case with the Borreby one, judging from the figure in Lyell's 'Geological Antiquity of Man,' p. 86. It may be doubted that the Plymouth skull, represented by Busk ('Nat. Hist. Rev.' 1861, Pl. V. fig. 6), is an exception. I possess a very remarkable skull, probably about 500 years or more old, taken last summer out of the beautiful ruins of Corcomroo Abbey, situated among the Burren mountains, in county Clare, which offers a close approximation to the fossil in the depressed form of the forehead: indeed, although not altogether so abnormal in this respect as the Neanderthal skull, it has in appearance a better development, in consequence of the median part of its frontal being a little more rounded. There is no reason to believe that it belonged to an idiot, as it happens that most of the skulls lying about the ruins have a low frontal region. It is singular that the inhabitants of Burren a few hundred years ago should have been characterized by a remarkably depressed forehead, while those now living have a well-developed cranial physiognomy.

ral features of resemblance between the Australian, Neanderthal, and ancient Danish crania; but it appears to me, judging from the figures (31 and 32) in the deeply philosophical work, 'Man's Place in Nature,' that a closer resemblance is assumed than really exists. No one would have any hesitation in admitting that the Borreby skull, represented under one of the figures cited, is strictly human,—nay, from what I have seen myself, I have no hesitation in saying that precisely the same cranial conformation is often repeated in the present day; but it has yet to be shown that any skulls hitherto found are more than *approximately* similar to the one under consideration.

The proposition at present contended for is apparently invalidated by the fact that, among certain species of animals—notably those under domestication—skulls very dissimilar from each other may be found. It is, therefore, to be apprehended that, however clearly the Neanderthal fossil may be shown to be inadmissible into the human species, an attempt will be made to set aside the consequent conclusion by an appeal to the fact alluded to. But this I contend is not a case in point, as will be evident after a moment's reflection on the various breeds of the Dog—the best known of our domesticated species. These breeds, so remarkably differentiated by cranial peculiarities, are *artificial*, whereas the varieties of mankind are *natural*. The dissimilar skulls met with in the former are merely striking illustrations of organic or structural modifiability, produced by what Darwin calls Natural Selection, but nothing more.

Again, some weight seems to be due to the consideration that the human species (in which I include all the existing races of man) is characterized by a great variety of skulls. We have abundant examples affording characters which closely link together the most dissimilar forms, so that it is impossible to draw a line of demarcation between the extremes of dolichocephaly and brachycephaly,\* or between the lofty forehead of Indo-Europeans and the depressed one of the Australian. Nay, the most degraded race we are acquainted with—the Mincopies of the Andaman Islands—may be strictly regarded as closely affined by cranial conformation to the highest intellectual races. It might, therefore, be urged that the Neanderthal skull is simply an aberrant form, but which is, nevertheless, inseparably linked on to the Indo-European type. If sufficient has not yet been adduced to dispel this idea, the following additional evidences, referring to the particular parts of the bones composing the fossil cranium, will, it is thought, be deemed fully adequate for the purpose.

Commencing with the *Frontal*.—Fuhlrott and Huxley have satisfactorily shown that this bone is furnished with large frontal sinuses; and apparently they regard these as the cause of the excessive prominence of the superciliary ridges. It may be reasonably doubted, however, that this is the case. Frontal sinuses, it is well known, do not always coexist with prominent brow ridges, as, for example, in the Australian and the Chimpanzee: on the other hand, the former may exist without being associated with any more than an ordinary de-

\* Professor Retzius distinguished *long* skulls, and *short* or round skulls, respectively by the names *dolichocephalic* and *brachycephalic*.

velopment of the latter. I have seen frontal sinuses extending to nearly the origin of the outer orbital processes, and almost large enough, even at their termination, to admit the small finger to be inserted into them, yet the brow-ridges were not particularly prominent. But whether the Neanderthal sinuses extend the whole length of the brow-ridges, or they are simply confined to the region of the *glabella*, their large size, in either case, is unusual in man, and they more strongly approach to, or resemble, as the case may be, those of the Gorilla.

As to the excessive prominence of the brow-ridges,—instead of regarding this feature as having been produced by the frontal sinuses,—there is more probability that, like the other extraordinary “elevations and depressions” of the skeleton, pointed out by Schaaffhausen, it is another speciality consequent on the greatly developed muscular system, which, from what has already been stated, evidently characterized the so-called Neanderthal man.

The orbital cavities appear to have had a circular rim, as in certain apes, there being no angle in that part joining the *glabella*. This is a feature unknown in any of the human races: in them the orbits are always subquadrate.\*

The roof of the orbital cavities is altogether less concave, particularly on the outer side, than in Man; and, although the inner extremity of the plate forming the roof is broken off, sufficient remains to show that the cavities contracted sooner than usual. The cavities also appear to have been uncommonly divergent: if this were actually the case, its significance would point towards one of the specialities of the Gorilla.

*Temporals.*—As already stated, only the impression of the upper *squamosal* is seen on the parietals; but it suffices to show, as pointed out by Huxley, that this part had a comparatively low arcuation: the highest point of the arch reaches little more than half the height it attains in ordinary human skulls. Besides occurring among apes, an equally low arcuated *squamosal* distinguishes the human foetus; and in some savage races—Australians and Africans—the same part is also depressed, but not so much as in the fossil. The Engis and Borreby skulls are strictly normal in this particular.†

\* In some apes the rim of the orbits is of the human form.

† Under this head may be noticed a part which appears to have been overlooked in the fossil. On an excellent cast, supplied by Mr. Gregory, of Golden-square, London, there occurs on the right side and in front of the *squamosal* impression a raised flattened plate, which looks like the upper portion of the *alisphenoid* (see Plate I. fig. 1, b): the forward situation of this plate prevents it being taken for the anterior part of the temporal; besides, its posterior side exhibits what appears to be the impression of the *squamosal*. The anterior margin of the supposed *alisphenoid* is about an inch behind the outer orbital process. Dr. Knox long ago pointed out in a Tasmanian skull a square-shaped bone, nearly an inch in extent, interposed between the *alisphenoid* and the parietal. I perceive that this abnormality in a Tasmanian skull is represented in fig. 225 of the beautiful edition, just published by Renshaw, of Dr. Knox's translation of Milne-Edwards' 'Manuel de Zoologie.' I have also seen the same bone, but only on the left side, of an "Australian" skull belonging to the Dublin University Museum. Perhaps this interposed bone corresponds, in nature as well as situation, to the flattened plate observable in the Neanderthal fossil.

*Occipital.*—The upper portion of this bone is quite semicircular in outline, its sutural (lambdoidal) border running with an even crescentic curve from one transverse ridge to the other:\* generally in human skulls, including the Engis one, the outline approaches more or less to an isosceles triangle.† The width of the occipital at the transverse ridges is much less than is common to Man; and the disparity is the more striking in consequence of the widest portion of the fossil occupying an unusually backward position.

Taking into consideration the forward and upward curving of the upper portion of the occipital bone as previously noticed, its semicircular outline, and smallness of width, we have in these characters, taken together, a totality as yet unobserved in any human skull belonging to either extinct, or existing races; while it exists as a conspicuous feature in the skull of the Chimpanzee.

*Parietals.*—In Man the upper border of these bones is longer than the inferior one; but it is quite the reverse in the Neanderthal skull. The difference, amounting to nearly an inch, will be readily seen by referring to figures 1 and 2, in plate II.; the former representing the right parietal of a British human skull, and the latter the corresponding bone of the fossil. These figures also show that the Neanderthal parietals are strongly distinguished by their shape, and the form of their margins: in shape they are five-sided, and not subquadrate, like those of the British skull; ‡ while their anterior and posterior margins have each exactly the reverse of the form characteristic of Man.

The *additamentum*, which undoubtedly gives the parietals their five-sided shape, is on a level with the superior transverse ridge, and much longer than usual. This peculiarity is common to the human foetus: I have, likewise, observed an approach to it in a "Caffre" skull belonging to the Dublin University Museum, in which, also, the upper and lower borders of the parietals are about equal in length. But still the abnormality of the latter case is not at all so extreme as the condition observed in the fossil. These particular features also are characteristically simial; for in extending our survey to the Chimpanzee, and some other so-called Quadrumanes, their parietals are seen to present a great similarity to those of the Neanderthal skull.§

I have now, as it appears to me, satisfactorily shown that not only in its general, but equally so in its particular characters, has the fossil

\* Plate II. fig. 4.

† Plate II. fig. 3.

‡ The outlines were taken by pressing a sheet of paper on the parietals; and, when in this position, marking their margins by following the bounding sutures: next, by cutting the paper according to the lines given by the sutures, and allowing it to retain its acquired convexity: the outlines were then marked off on another sheet of paper. Possibly the antero-inferior angle of the Neanderthal parietal, as given in the figure, is not strictly correct, owing to the coronal suture being obliterated in that part, but I venture to state that it is approximately true.

§ On the cast, an incised line runs from the lambdoidal suture (where the *additamentum* joins it) towards the posterior tubercle. Is this the suture which occurs near and parallel to the transverse ridges in foetal skulls, and occasionally in that of adults? In the skull of the "Caffre," noticed in the text, this suture, which is only seen on the right side, is situated above the ridge; but in the fossil, it is below this part.

under consideration the closest affinity to the apes. Only a few points of proximate resemblance have been made out between it and the human skull; and these are strictly peculiar to the latter in the *foetal state*. The cranium of the human foetus, however, possesses the lofty dome, the forward position of the frontal respectively to the outer orbital processes, the greatest width at the parietal centres of ossification, and the vertical occipital, which are so conspicuous in the adult, but which are remarkably non-characteristic of the Neanderthal skull. Besides, so closely does the fossil cranium resemble that of the Chimpanzee, as to lead one to doubt the propriety of *generically* placing it with Man. To advocate this view, however, in the absence of the facial and basal bones, would be clearly overstepping the limits of inductive reasoning.

Moreover, there are considerations of another kind which powerfully tend to induce the belief that a wider gap than a mere generic one separates the human species from the Neanderthal fossil.

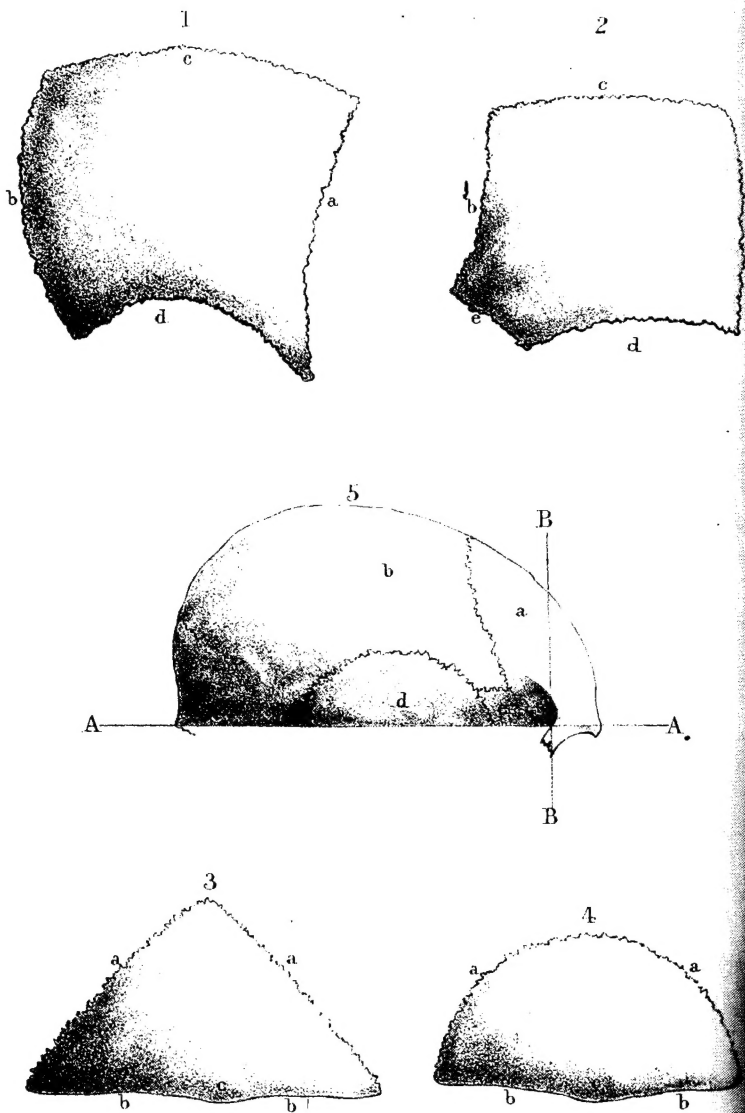
The distinctive faculties of Man are visibly expressed in his elevated cranial dome—a feature which, though much debased in certain savage races, essentially characterizes the human species. But, considering that the Neanderthal skull is eminently simial, both in its general and particular characters, I feel myself constrained to believe that the thoughts and desires which once dwelt within it never soared beyond those of the brute. The Andamaner, it is indisputable, possesses but the dimmest conceptions of the existence of the Creator of the Universe: his ideas on this subject, and on his own moral obligations, place him very little above animals of marked sagacity; \* nevertheless, viewed in connection with the strictly human conformation of his cranium, they are such as to specifically identify him with *Homo sapiens*. Psychical endowments of a lower grade than those characterizing the Andamaner cannot be conceived to exist: they stand next to brute benightedness.

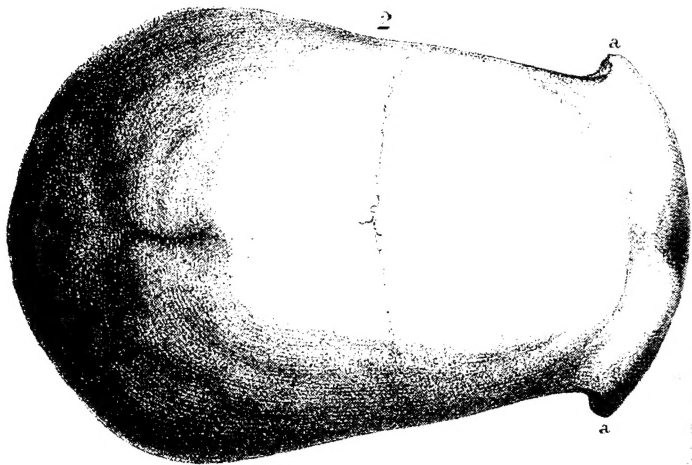
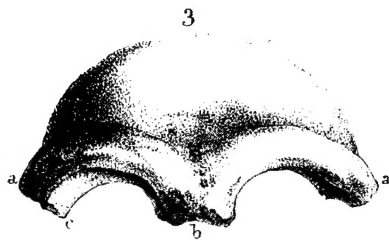
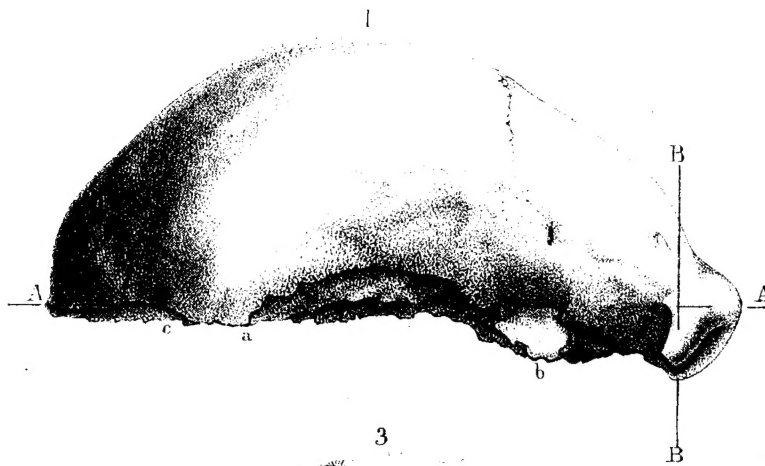
Applying the above argument to the Neanderthal skull, and considering that it presents only an approximate resemblance to the cranium of man, that it more closely conforms to the brain-case of the Chimpanzee, and, moreover, assuming, as we must, that the simial faculties are unimprovable—incapable of moral and theositic conceptions—there seems no reason to believe otherwise than that similar darkness characterized the being to which the fossil belonged.†

\* It has often been stated that neither the Andamaners, nor the Australians have any idea of the existence of God: there are circumstances, however, recorded of these races which prevent my accepting the statement as an absolute truth.

† A paper advocating the views contained in this article was read at the last meeting of the British Association, held in Newcastle-on-Tyne. In that paper I called the fossil by the name of *Homo Neanderthalensis*; but I now feel strongly inclined to believe that it is not only specifically but generically distinct from Man.







## EXPLANATION OF PLATE I.

FIG. 1.—*Right Side of Neanderthal Skull.*

- A A. Glabello-occipital plane.  
 B B. Line intersecting the forehead at right angles to the last plane through both outer orbital processes.  
 (These lines are interrupted so as not to obscure any parts of the skull.)  
 a to a'. Border of squamosal impression.  
 (Letter 'a' is just below the widest part of the skull.)  
 b. ? Alisphenoid.  
 c. Portion of additamentum.

FIG. 2.—*Top of Neanderthal Skull.*

- a, a. Outer orbital processes.  
 The transverse line on the middle of skull represents the coronal suture. (This and the corresponding line in Fig. 1 are copied from Busk's figures.)  
 The semicircular line at the posterior part of skull represents the lambdoidal suture.  
 The medio-longitudinal line represents the sagittal suture.

FIG. 3.—*Front of Neanderthal Skull.*

- a, a. Outer orbital processes or horns of the brow ridges.  
 b. Inter-orbital space.  
 c. Portion of roof-plate of right orbital cavity.  
 (Only the anterior half of the frontal bone is represented.)

\* \* The figures in this plate are taken from a plaster cast.

## EXPLANATION OF PLATE II.

FIG. 1.—*Right Parietal of a Human (Irish) Skull.*

- a. Coronal edge.  
 b. Lambdoidal edge.  
 c. Sagittal edge.  
 d. Squamosal edge.

FIG. 2.—*Right Parietal of Neanderthal Skull.*

- a, b, c, d. Same as in last Figure.  
 e. Additamental edge.

FIG. 3.—*Occipital of a Human (Irish) Skull.*

- a a. Lambdoidal edge.  
 b, b. Transverse ridges.  
 c. Occipital or posterior tubercle.

FIG. 4.—*Occipital of Neanderthal Skull.*

Letters same as in last Figure.

FIG. 5.—*Right Side-view of Dome of Human Skull.*

- A A. Glabello-occipital plane.  
 B B. Glabello-occipital intersecting plane.  
 a. Frontal.  
 b. Parietal. (The letter is on the centre of ossification and widest part of the skull.)  
 c. Occipital.  
 d. Temporal.  
 e. Alisphenoid.